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Student Medicine

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EDITOR
Ralph W. Alexander, M.D.

ASSISTANT EDITORS
Jennette Evans, M.D.
Alexius Rachun, M.D.

CONSULTING EDITOR
Norman S. Moore, M.D.

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Editorial Comment

ALLERGIC REACTIONS TO PENICILLIN

DR. NECHELES presents three instructive case reports of reactions to injected penicillin which developed despite the demonstration of negative intradermal tests to penicillin before administration. This points up the difficulty encountered in any attempt to prevent reactions, either immediate or delayed, to injected penicillin. Indeed, there is no way presently known to avoid all reactions to penicillin other than not to prescribe it.

As Dr. Necheles points out, certain measures can be taken to lessen the incidence of penicillin reactions. These include careful history-taking in regard to the previous administration of penicillin and to the occurrence of any symptom which might suggest sensitivity following such administration.

If a person has never received penicillin, he is not apt to react, and if reaction does occur, it is apt to be mild. But a negative history of having received penicillin is no guarantee that the person has had no contact with it, for it is said that the widely prevalent use of antibiotics in animal feeds often results in demonstrable amounts of penicillin in the milk delivered to the consumer. Thus nearly every person must be regarded as having had previous contact with penicillin. A history of any type of allergic reaction is also cause for caution as allergic individuals seem more prone to become sensitive to penicillin.

Intradermal testing has been found to be of value in finding some of the individuals who are sensitive to penicillin, but a negative skin test is no guarantee against reaction, as demonstrated by the fact that all three of the cases described by Dr. Necheles had negative intradermal tests before treatment, and indeed one had a negative response when retested several months after a serum-sickness type of reaction. It has been observed that the intradermal test is of little or no value in determining the likelihood of immediate anaphylactic reaction, the type which has accounted for most of the deaths from penicillin.

Antihistamine drugs may be of value, given either before or after administering penicillin, but there is not universal agreement on this. Certainly it can be said that reactions to penicillin may occur despite the use of antihistamine substances in large doses.

Since penicillin is still our most useful antibiotic, it will continue to be used widely, but the frequency of reactions to it can be decreased by using it wisely. It should not continue to be given for the common cold and the nonspecific illness, usually called "grippe," "flu," or "virus," or for other conditions for which there is no certain indication for its use. From the reports one gains the impression that a high percentage of the immediate fatal reactions have occurred when penicillin was given for trivial conditions. This may be explainable on the basis that the more severely ill patient is protected by the increased adrenal cortical function which the acute illness has produced via the stress reaction.

The mode of administration is also of importance. The oral route is not only less likely to produce sensitization but, if sensitization already exists, oral administration is less apt to provoke a reaction. Further, if reaction does occur, it will be less severe than if the penicillin had been administered by injection. This is not to imply that penicillin orally is innocuous, for reactions can occur. We have seen one immediate anaphylactic type of reaction of moderate severity to one tablet of penicillin taken orally. Since rare fatal reactions to other oral medications have been reported, it is probable that such reactions to oral penicillin will be reported if they have not already been.

The experience with oral penicillin at the Cornell Clinic and Infirmary over the past year or more has been very satisfactory. Statistical data is not presently available, but our impression is that reactions have been few and of a less severe character than is experienced when penicillin is given by the intramuscular route.

Prevention of reactions to penicillin rests squarely on the physician. The two most important points being, first, give penicillin only when definite indications exist, and, second, give it orally whenever feasible. Screening by means of a careful history, to eliminate potential reactors, is important before giving penicillin by any route and a skin test (intradermal) should be done before it is given by injection.

Alcoholism on the College Campus*

FRED E. LAWRENCE, M.D., MEDICAL DIRECTOR
COMMISSION ON ALCOHOLISM, STATE OF INDIANA

I MIGHT quickly dispose of this subject by saying "there ain't no such animal, and now let's all get out and enjoy the lovely Colorado scenery." I could even make out a good case for the nonexistence of alcoholism in our colleges, which would probably excite a warm glow in the hearts of many administrators. I could cite my own experience at the University of Missouri, where in one year I saw only two patients who could be classified as alcoholics. Since they were both veterans in their late twenties and not really typical of our student population, I could use that experience as the basis for the statement that there really was no alcoholism there.

Actually, such an approach to the problems of alcoholism has been fairly typical of the attitudes in the family, the schools, in business and industry. There is something unpleasant and shame-provoking about alcoholism, which is quick to elicit denial and concealment of the problem.

In order to arrive at an intelligent understanding of any disorder, we must know what that disorder is and how it develops. Here I would like to borrow a long quotation from a speech my friend Selden Bacon gave at the meeting of the National Committee on Alcoholism in New York in 1954:

What is alcoholism? From the point of view of research that is the first question. What is it? Now, I think it has been one of the greatest problems in the last 300 years, in trying to meet the problems of alcoholism,

* Read at the meeting of the American College Health Association, April 29, 1955, Colorado Springs, Colorado. Reprinted from the *Proceedings* of the American College Health Association.

to answer this question. And the answers have inevitably, apparently, been phrased in terms of one concept, and I think it is perhaps the outstanding achievement of the group up at Yale to state that alcoholism is a complex condition. That sounds very simple. You might say, "Well, anybody knows that." I have to insist that very, very few people know it. It is not merely a matter of the conception of alcoholism in a very simple framework. It is a legal problem, it is a tax problem, it is an ethical problem, it is a religious problem, it is a moral problem, it is a social problem, it is a medical problem, it is a psychiatric problem, and they are certain that this is the case. I believe that one of the greatest problems facing us today, facing those of us who wish to do something about alcoholism (I care not on what level)—it is one of the greatest problems facing us today—is that of having a complex conception of this condition. There are those today who still wish this to be a problem of one part of the liver, or one part of the law, or one part of the institution of education, or some other, and they are convinced that they are right. In some ways, of course, all of us can be glad that people are interested, that they are stimulated to do work, but the narrow single interpretation of this problem, whether it be medical, legal, social, or other, is inevitably going to lead to failure. This, I think, we can guarantee, and the reflections of these changes at the Yale center during the years 1938 to 1943 is perhaps some noteworthy signal of the growing appreciation that the fight against alcoholism, which has been going on for centuries, has finally turned; it has turned a major corner. There was going to be an attack, an attack on the principle that this is a simple, one-type, unitary problem to be met by one discipline. This it is not.[1]

Well, then, what is it? How does it develop? I believe that only with some understanding of the answers to these questions can we evaluate the problems of alcoholism on the college campus. We must know what alcoholism is, who the alcoholic is, and how he gets to be that way.

There are many definitions of alcoholism, some of which contribute even further to the already great semantic confusion in this field. But all acceptable definitions do have certain common features—the loss of control over the use of alcohol and the harmful effects on the physical, mental, social and economic life of the individual. Simply, I think we may say that alcoholism is the excessive, at least partially uncontrolled use of alcoholic beverages which repeatedly

[1] S. D. Bacon, unpublished speech, National Committee on Alcoholism Meeting, New York City, March, 1952.

exerts a harmful effect on the physical or mental health or the social or economic life of the user.

Who is the alcoholic? Simply, again, one who shows the signs of alcoholism. Probably there are four million of them in the United States today, but if we ask the question, "Who is he?" almost invariably the answers we receive are stereotypes. He is the skid-row bum, he is the lost week-ender, he is the rapidly disintegrating neurotic character out of an F. Scott Fitzgerald novel. But these popular stereotypes, while they may account for a small segment of the entire alcoholic population, are grossly distorted, atypical pictures of the over-all alcoholic population.

Well, just who is he? I think, before we answer that, we should examine the road he travels in getting that way.

Up until about ten or fifteen years ago, any understanding of the problems of alcoholism was inevitably phrased in the concepts of one discipline—medicine, or psychiatry, or jurisprudence, or theology, or what you will. So all too often the alcoholic was to the psychiatrist a neurotic, a psychotic, or a psychopath; to the judge or lawyer, a criminal; to the clergyman, a sinner; and to the physician—as well as to all the others—an enigma.

In 1946 Dr. E. M. Jellinek of the Yale Center of Alcohol Studies published one of the basic papers in the literature of alcohol—"Phases in the Drinking History of Alcoholics."[2] This brilliantly inspired piece of research ignored all the previous concepts of alcoholism and for the source of its material turned to—of all things—the alcoholics themselves.

I think this is basic: If we are to have any clear concept of alcoholism in college, we must know the natural course of the disorder, and for this reason I want to dwell on Dr. Jellinek's findings at some length.

Perhaps seventy million of our population use alcoholic beverages, and for the most part they use them according to certain prescribed customs. In other words, they drink according to what is for them and for their group a norm—whether that norm be one annual

[2] E. M. Jellinek, Phases in the Drinking History of Alcoholics, Analysis of a survey conducted by the official organ of Alcoholics Anonymous, *Quarterly Journal of Studies on Alcohol, 7:* 1–88, 1946; also in *Quarterly Journal of Studies on Alcohol, 13:* 673-684, 1952.

drink on New Year's Eve or three cocktails before dinner each night. Such drinking, whatever other functions it may serve, is always culturally determined and socially motivated. But in the course of such drinking the potential alcoholic learns that the use of alcohol offers him a certain amount of relief, be it from shyness, tension, anxiety, worry, or what you will. In the course of social drinking alcohol comes to have a second, personal value to the individual. Then after a time, a few months or a year or so, we see the first clear-cut sign—a positive, upward change in the drinking pattern. Our subject drinks more frequently, he drinks more, and he drinks for personal reasons.

At this point he is not an alcoholic, he is merely one of a large group of potential alcoholics, not all of whom are destined to develop the disorder. But in the course of time further changes occur. The most striking of these are the black-outs, to which Jellinek refers as palimpsests.

Somewhere in the course of our subject's drinking, after few or many drinks, he comes to with a loss of memory for a period of perhaps a few minutes, perhaps a few days. If he makes careful inquiry, he will learn that, although pretty obviously intoxicated, he appeared during that period to be functioning in a normal fashion for those circumstances. He walked, talked, made decisions, though perhaps not wisely, but in no way did he appear to others to be radically different from what he usually was when drinking.

At about the same time there are signs that alcohol has assumed a role of greater than usual importance to him. He drinks surreptitiously and avidly. He prepares himself for the party with a shot or two before leaving home. He helps mix the cocktails and sneaks a drink or two while so doing. At the same time he drinks quickly—the first two, three, or four drinks have to be ingested hurriedly before he can slow down, relax, and drink like others. I might suggest here that there are certain similarities in this process to that in the narcotic addict known as a "mainline shooter"—one who has to achieve the effect of the drug so quickly that he administers it intravenously.

Our subject shows by other signs that alcohol is more important to him than to others. Although he does not express them, he usually has feelings of guilt about his use of alcohol. He begins to avoid

reference to the subject both as a generality and as it relates to him. He doesn't want to talk about it, and at the same time there is good evidence to suggest that he is much more preoccupied with the entire subject than is the normal individual.

While all of this is going on, the black-outs may be increasing in frequency. Our subject has now reached the end of what we refer to as the prodromal phase. He is not yet an alcoholic, although his chances of so becoming are good. This phase has lasted a few months up to four or five years. It is followed by the crucial phase.

The first event in this phase of alcoholism is of utmost significance, since it marks the development of alcoholism as we understand it. This is loss of control. It occurs in two stages, the first of which we are now concerned with. Here one drink leads to the inability to control further drinking, which in turn continues until our subject is too drunk or too sick to drink any more. He is now an alcoholic.

I do not believe we need dwell at any great length on the next thirty-five steps in this process. In the remainder of the crucial phase we may see rationalization of the drinking pattern. That is, "If I didn't have this nagging wife, these annoying children, this tyrranical boss, I wouldn't drink." Grandiose and aggressive behavior may appear. He may change the pattern of his drinking—"It's the whiskey that is doing this. I'll change to beer, or to wine, or to vodka." There may be periods of going on the wagon and attempts to alter the situation by change of environment. Our subject may complain that after all it is the dreary plains of Kansas that make him this way, now if he just had a little place up in the Green Mountains of Vermont, all would be different. And with this he departs for El Paso.

Social pressures develop; he loses jobs and friends and outside interests. He has to protect his supply of alcohol, and he develops unreasonable resentments against those who attempt to interfere with his drinking. He may show remorse and self-pity on the one hand and alcoholic jealousy bordering on paranoia on the other. He neglects his nutrition and may require medical care.

And he has hang-overs. These have begun even in the prodromal phase but have become of increasing severity through the crucial phase. Those with first-hand experience usually use the customary Hollywood adjectives in describing them—they are colossal, they

are monumental, and, they say, unless you have experienced them, you simply can't know what we are talking about.

Unfortunately there is an almost sure-fire cure for these—more of the same. If the alcoholic can get down the first two or three drinks, the hang-over evaporates. So in time he comes to regular morning drinking, and this marks the end of the crucial phase.

The chronic phase begins with the second stage of loss of control—benders. Until this point our subject had been unable to control his drinking once he had started, but he could control whether or not he drank. Now this control too slips away, he can no longer be sure that at any given time he will not drink, and he goes on prolonged sprees or benders, which may last for days or weeks.

After this the whole process usually goes rather rapidly. There is marked social and ethical deterioration, obsessive drinking, the possible development of alcoholic psychoses, and, finally, the failure of the entire rationalization system.

This is the end of the line. Only three things may happen: recovery, mental illness, or death.

From beginning to end all of this may require five, ten, or twenty years. Usually it transpires much more rapidly in women than in men.

Now we can understand something of the natural course of this disorder and begin to examine the problem as it may exist on our college campuses.

Alcoholism as we have defined it—the crucial phase beginning with loss of control, through the chronic phase terminating inevitably, as it does, in either recovery, mental illness, or death—is, among the students of our colleges, so rare as to be a matter of very minor concern. In order to bring this problem clearly into focus we must go back to the prodromal phase of alcoholism, where our subject is not yet an alcoholic, examine it, and attempt to pick out certain clues about the potential alcoholic. In other words, what is the prealcoholic personality of the alcoholic? Here again we encounter the problem of the stereotype. Psychiatrists and physicians, although less likely to do so than lay individuals, are not immune to thinking in such terms, and I believe that any clear concept of the prealcoholic personality has been obscured by such thinking.

The literature of alcohol abounds in descriptions of the alcoholic

personality in such terms as childish, immature, demanding, infantile, egocentric, and orally dependent. I think the usual reasoning has been that, since these findings are so often and so strikingly apparent in the alcoholic, they must therefore be present in the prealcoholic too. Let me suggest that this is not so. The reasons people use alcohol are so varied, so manifold, that we cannot begin to catalogue them all. Perhaps our understanding of the problem might be enhanced if we rephrased the question, "Why do people become alcoholics?" into "Why don't they?"Although there are seventy million users, there are only four million alcoholics. Alcohol possesses what we might call a psycho-pharmacological magic quality. In proper doses stress, worry, anxiety, depression, and all the other psychological ills with which man is afflicted may be dissipated. So our understanding of the problem of alcoholism would be greatly enhanced if we had adequate knowledge of the restraining forces which prevent so many individuals from becoming alcoholics.

But I do not believe we can generalize about the prealcoholic personality from the findings in those alcoholics studied years after the onset of their illness. In alcoholism this, I believe, is what happens. Alcohol enchances the weakening of repressing forces and aids in the escape of that which is repressed. Those defenses, parts of the personality of the individual, are temporarily weakened during each drinking episode and are permanently weakened by repeated indulgence in alcohol. In other words, the balance between the repressed and the repressing forces is altered, and gradually the defensive mechanisms of the personality crumble before the assaults of alcoholism. In such a process as I have outlined, it is highly unlikely that the individual is acquiring or can acquire new, successful defense mechanisms. Under such circumstances the only course possible is one of regression, eventually to an oral level. In this way we can explain the significant predominance of oral features in the personalities of those in the advanced stages of alcoholism.

Such a hypothesis, however, does not require that all who arrive at the point of similarity start from another point of similarity. That is like saying that everyone who arrives in Colorado Springs started from Denver.

Alcoholism may begin in many personality types and for many reasons. Indeed, we often see the excessive use of alcohol as one of

the first signs in schizophrenia, the manic-depressive psychoses, the involutional depressions, and some of the organic psychoses. Sometimes it is so prominent a sign that it masks the underlying disorder. In the same way, alcoholism, when moderately advanced, can mask the underlying personality disorder of the alcoholic. To sum up, we may say that many different personality types, using alcohol for many different reasons, may, in the end stages of alcoholism, arrive at a point through the process of regression where they show many similarities of personality. But there is not a characteristic pre-alcoholic personality and we cannot yet speak with any real assurance about those personality factors which may make a given individual vulnerable to alcoholism. We can, however, through a critical examination of the prodromal phases of alcoholism, select certain findings which should be of value in detecting the potential alcoholic.

To review that phase for a moment, we saw that the first sign was a positive, upward, deviation from the normal social drinking pattern, that this was followed by alcohol assuming a greater and a personal significance to the individual, that the drinking pattern changed to one which was avid and surreptitious, and that black-outs occurred with some degree of frequency.

Up to the present time we have only one good study of the drinking habits of college students. This, of course, is Straus and Bacon's *Drinking in College,*[3] a report on a survey of twenty-seven colleges of different types, conducted between 1949 and 1951, and published in 1953. In this work there is sufficient divergence of findings among colleges of different types to make us cautious in generalizing about the over-all college student body, but several general conclusions can still be drawn from it.

College students drink; 76 per cent of those participating in the survey reported using alcoholic beverages, 61 per cent of the women and 80 per cent of the men. There was definite evidence that this percentage was related to the type of college, to family income (rising with income), to religious affiliations (highest in the Jewish and least in the Mormons), and to ethnic group. At the same time it increased with each college year. Again it was clearly evident that many students came to college already using alcoholic beverages. In fact, 79

[3] R. Straus and S. D. Bacon, *Drinking in College* (New Haven: Yale University Press, 1953).

per cent of the male users and 65 per cent of the female had begun their drinking before entering college. To phrase that another way, it is not possible to blame our colleges and universities for initiating the majority of their student drinkers to the use of alcoholic beverages They come to college already initiated.

What these students drink and some of the circumstances under which they drink (quite different for men and women, incidentally) make quite interesting reading. However, much of it is not pertinent to a short discussion of the problem of alcoholism. What is pertinent is the amount they drink, the frequency, the personal importance alcohol acquires for them, and the number of scholastic, social, economic and legal difficulties it causes them. These factors, we believe, will aid us in our search for the potential alcoholic in our college population.

In the study by Straus and Bacon, 57 per cent of the male and 47 per cent of the female users used alcoholic beverages twice a month or more, 21 per cent of the male and 10 per cent of the female more often than once a week. Evaluation of the quantity drunk is a more difficult problem, but it appears certain that some part of the college drinking population does use alcohol with sufficient frequency and in adequate amounts to attract our attention as potential alcoholics.

There are more reliable indices than frequency of drinking and quantity consumed. Of the users 34 per cent of the males and 9 per cent of the females had passed out one or more times. While 66 per cent of the male and 85 per cent of the female users reported no complications from their drinking, 11 per cent of the male and 6 per cent of the female users reported damage to friendships, and 4 per cent of the male and 0.7 per cent of the female users reported accidents or injuries as the result of drinking. Additionally 2 per cent of the male users reported formal punishment or discipline; 18 per cent of the male and 5 per cent of the female users reported at least one black-out; 13 per cent of the male and 3 per cent of the female users reported lone drinking to the point of drunkenness. Morning drinking had ocurred in 16 per cent of the men and 7 per cent of the women. Aggressive, destructive, or malicious behavior while drinking had occurred in 11 per cent of the men and slightly under 1 per cent of the women.

In summary then, we may say that alcoholism, as I have defined it here, is a very minor problem on the college campus. The potential alcoholic group may be recognized by several signs: drinking behavior which deviates sharply from the norm for the group, increased personal importance of alcohol, solitary drinking, accidents, injuries, or disciplinary action resulting from excessive use of alcohol.

Many of this group do not go on to the fully developed syndrome of alcoholism. They remain potential alcoholics. In some the first disciplinary action, the first arrest, or the first referral to the physician or the psychiatrist may be sufficiently strong as a deterring influence as to remain effective throughout the individual's life. Moreover, in the age group under discussion we are dealing with personalities still in the process of maturation. Undoubtedly this process results in changes for the better in many of the potential alcoholics.

Certainly all students who show the prodromal signs I have described should be subjected to careful psychiatric evaluation and, when indicated, therapy. Such a study, in addition to its therapeutic value, will add considerably to our knowledge of the potential alcoholic.

Before closing, I wish to rectify one or two erroneous impressions I am sure I have left with you.

Alcoholism and excessive drinking are not synonymous, and not all excessive drinkers are alcoholics.

The excessive use of alcohol, as I previously pointed out, may be symptomatic of some of the psychoneuroses and the psychoses, both organic and functional. It may be the first presenting symptom and, because of its severity, may even mask the underlying disorder. I have repeatedly seen patients who appeared on superficial examination to be alcoholics but who, in the course of hospitalization, enforced abstinence, and further study, were found to have schizophrenia, involutional depressions, or general paresis.

Additionally, many people drink to excess who are neither overtly psychotic or psychoneurotic. It is in this area, I believe, where the use of alcohol presents the most serious problems to our colleges. While the alcoholic is rare, asocial or antisocial behavior while under the influence of alcohol is not. At this point the problem becomes, I believe, one for the broader area of mental health, for alcohol serves only to release that which is already present in the personality in latent form.

Penicillin Reactions

HENRIETTE NECHELES, M.D., UNIVERSITY OF CHICAGO

THE provision of health service for the students in an institution the size of the University of Chicago involves problems not encountered in private practice. The aggregation of a large number of students in classes and dormitories greatly increases the risk of spreading contagious diseases, and for this reason the use of fast-acting antibiotics is frequently indicated. Among these, penicillin is still the drug of choice because of its effectiveness, tolerance, and low cost. Recently, however, the concern about dangers involved in the repeated administration of penicillin has greatly increased, as we have become increasingly aware of the frequency of sensitization and have noted the number of reports of severe, sometimes fatal, anaphylactic shock reactions consequent to parenteral injections of the antibiotic.[1]

With the increasing tendency of many physicians to give "a shot of penicillin" indiscriminately and with patients often demanding it, by now almost everbody has been exposed once or repeatedly to a series of such injections. As a result of these factors, we have found more serum-sickness-type reactions among our students during the last two years than in the past. Review of the medical literature for the past five years indicates that we share this experience with most other large medical centers.[2]

The student health clientele is, compared to private practice, a fluctuating group. The previous history and drugs used in the treatment of the students' past illnesses are often unknown to the student health physician, and many younger patients are unable to give an

[1] J. Farber, J. Ross, and G. Stephens, Penicillin Reactions, *Calif. Med.*, *81*:9, 1954; S. Feinberg, A. Feinberg, and C. F. Moran, Penicillin Anaphylaxis, Nonfatal and Fatal Reactions, *J.A.M.A.*, *152:* 114–119, 1953; B. Jeffery and P. Borroe, Acquired Hypersensitivity to Sodium PAS, Streptomycin and Penicillin, *Brit. Med. J.*, *2:* 647, 1952; W. Lindemeyer, Zur Frage der Penicillinuberempfindlichkeit, *Arch. f. Dermat. und Syphilis*, *193:* 325–339, 1951; P. S. Mayer, *et al.*, Penicillin Anaphylaxis, *J.A.M.A.*, *151:* 351–353, 1953; S. Siegel, Fatal and Near Fatal Penicillin Anaphylaxis, *J. Allergy*, *24:* 1–10, 1953.

[2] S. S. Winton and E. D. Nora, Immunologic Aspects of Penicillin Reactions, *Amer. J. Med.*, *18:* 66–73, 1955.

accurate report concerning former illnesses and their response to therapy.

In order to protect our patients, we question carefully every individual prior to the initiation of antibiotic treatment about previous penicillin injections and the occurence of reactions to them for as long as three weeks following their administration. Anyone with a history of hives, itching skin, edema, or more serious reactions following penicillin therapy is excluded from treatment with this drug. In allergic patients the history is taken with great care because, according to Malansky and Sanger, the delayed serum-sickness type of reaction was more often seen in them than in nonallergic patients.[3]

From July 1, 1953, to December 31, 1954, we treated 632 patients with penicillin, giving a total of 1,497 doses. The diagnoses are roughly categorized in Table 1. None of these patients experienced

Table 1. Diagnoses of patients receiving parenteral penicillin treatment.

	No. of patients	*Per cent of total*
Pharyngitis and upper respiratory infections	388	61.4%
Miscellaneous and unidentified	197	31.2
Local infections (wounds, cellulitis, bites)	15	2.4
Dental infections and prophylaxis for extractions	15	2.4
Other infections	13	2.0
Streptococcal carriers	4	0.6
TOTALS	632	100.0

immediate reactions but eleven delayed reactions of the serum-sickness type were observed, which was an incidence of 1.74 per cent of the patients. Before receiving a penicillin injection every patient with a history of allergy was tested intradermally with 0.02 cc. of a solution of Aquacillin (Schenley) in physiological salt solution containing 1,000 units per cc., and the result was noted after 15 and 30 minutes. In spite of this precaution, three patients were found who had shown a negative response to the skin test but then experienced severe delayed, serum-sickness-type reactions two weeks later. The other eight cases occurred in patients who were not skin

[3] L. Malansky and M. Sanger, Methods of Decreasing Penicillin Sensitivity, *Antibiotics and Chemotherapy, 2:* 385–388, 1952.

tested for penicillin sensitivity because they denied any prior history of allergy.

The following summaries describe the findings in the three cases with an allergic history who initially manifested no intradermal sensitivity to penicillin but later developed serum-sickness-like reactions after therapeutic administration of the drug.

CASE REPORTS

Case 1. G. H., a twenty-nine-year-old male student, under desensitization treatment for ragweed, molds, and house dust, was seen on April 15, 1954, with a febrile pharyngitis, and beta hemolytic streptococci were found in the throat culture. The patient had taken previous penicillin treatments without untoward reactions. He was tested intracutaneously with the test dilution of Aquacillin and showed no reaction after 15 and 30 minutes. On this basis 600,000 units of Aquacillin were given daily for five consecutive days. On April 25, 1954, he had a large local swelling at the site of injection and was given Co-pyronil (Pyrrobutamine compound, Lilly), one pulvule twice daily. Three days later he developed a generalized urticarial eruption, temperature 36.8°, but without involvement of the joints. The rash subsided without further complications. Urinalysis and blood count at this time were normal. On November 26, 1954, he was retested to antibiotics and still gave a negative reaction to Aquacillin. Thus, this patient underwent a typical serum-sickness-like reaction to penicillin, although neither before nor after its administration did he show any skin test sensitivity.

Case 2. C. M., a forty-two-year-old male student, a severe asthmatic, was under desensitization treatment to ragweed, molds, and house dust. On June 21, 1954, he was seen with a deep, ragged, penetrating wound of the left thumb, close to the extensor tendon, with extensive tissue damage, due to a human bite sustained one hour before admission. The wound was cleansed with soap and water. An intradermal skin test with Aquacillin was applied and it was negative after 30 minutes. He then was given 1,000,000 units of Acquacillin, followed by 600,000 units daily for four consecutive days. Before the first injection he took 100 mg. of Pyribenzamine and was told to take

100 mg. three times daily for the next five days. Tetanus antitoxin was not administered because the patient had received a series of toxoid injections a few months previously. On June 25, 1954, the wound was healed. Four weeks after the accident, on July 22, 1954, he was admitted to Billings Hospital with generalized urticaria and severe bronchial asthma. The temperature was 38° orally. Significant laboratory findings were as follows: urine positive for sugar; blood sugar normal; white blood cell count was 9,500, with 90 per cent neutrophils, 7 per cent lymphocytes and 3 per cent eosinophils; the sedimentation rate was 4 mm. per hour. He was given cortisone, 25 mg. three times daily, and phenobarbital, 30 mg. three times daily. The temperature rose to 39° orally, and the pulse to 110. On July 9, 1954, he was retested intradermally with the test dilution of Aquacillin. Within ten minutes he exhibited a wheal 5 cm. in diameter, shortness of breath, and a flushed face. Epinephrine 1:1,000, 0.3 cc., was injected into the site of the test, and a constrictor applied proximal to it. After 30 minutes the constitutional symptoms had disappeared and the site of the injection was normal.

This patient, therefore, initially showed no intradermal sensitivity to penicillin but after therapy with the antibiotic developed a severe serum-sickness-like reaction and then on retesting manifested an anaphylactic type of response with severe constitutional symptoms.

Case 3. M. O., a twenty-six-year-old male student, required prophylactic penicillin therapy prior to dental extraction. On November 16, 1954, he was given 600,000 units of Aquacillin after an intradermal skin test had shown no reaction within 30 minutes. Two days later he reported with a fine morbilliform rash, which dissappeared after Pyribenzamine was given, 50 mg. four times daily. On November 26, 1954, the patient was seen in our dermatological department with giant urticaria. Treatment with Pyribenzamine and Histadyl did not help. He was given massive doses of Chlortrimeton, Pyribenzamine, Histadyl, and ephedrine, while a shake lotion with ¼ per cent menthol was applied locally. The laboratory findings showed an increase in the white blood count to 15,050 with a normal differential count. On December 3, 1954, the patient complained about painful swollen joints. Hives still occurred frequently. Further ob-

servation was made impossible through lack of co-operation on the part of the patient.

Thus this patient also developed a severe, serum-sickness-like reaction after penicillin therapy, even though initially he revealed no sensitivity to the antibiotic following intradermal testing.

The history of these three patients demonstrates that negative intradermal skin tests to penicillin do not preclude the occurrence of serum-sickness type of reactions ten days or later after the first injection. We want to point out, however, that from a large group of patients given penicillin injections after their skin tests were negative, these three were the only ones to experience serious after effects. According to a careful survey of the literature, screening patients by skin tests does not help in avoiding immediate anaphylactic shock reactions, which are the most dangerous of the possible sequelae. In the first case, the skin reaction to penicillin was negative both times, even after the patient experienced an episode of pronounced serum sickness. In the second case, the patient showed a negative skin test before, and a very strong local and immediate systemic reaction, requiring the administration of Epinephrine, upon retesting after his illness. This patient had been badly in need of antibiotic treatment because human bites are known to be particularly dangerous.

The high doses of penicillin received by these patients might have been a factor in producing the severe aftereffects. Malansky and Sanger find 7.8 per cent reactions in patients treated with large doses of penicillin compared with 1.2 per cent reactions in those who received average doses, in their evaluation of 124 patients with serum-sickness-type reactions.[4] Collins-Williams and Vincent observed only three positive skin reactions in seven children known to be allergic to penicillin.[5] Some authors recommend the combination of Benadryl or Chlor-Trimeton solution with the penicillin. As seen in our second case, the administration of high doses of Pyribenzamine before treatment and for three consecutive days after did not prevent the later illness. Furthermore, the general failure of antihistamines to control

[4] *Ibid.*

[5] Collins-Williams and Vincent, Sensitivity Reaction to Penicillin in Children, *Ann. of Allergy, 11:* 454–469, 1953.

the manifestations of penicillin sensitivity suggests that this procedure will be of little value.

Other authors suggest methods of desensitizing patients to penicillin. Lee Alexander emphasizes the necessity for doing this with highly sensitive patients, where penicillin is the drug of choice, as in syphilis, or for those who are forced to continue working with it, as, for example, nurses.[6] His method of desensitization, however, consisting of three injections daily, is not workable on an outpatient basis and would have to be modified considerably before usable under our conditions.

According to our experience, we cannot always prevent the occurrence of serum sickness. With a reasonable amount of care we can cut it down to a small proportion of cases. A history of previous injections and how they were tolerated, a history of allergic manifestations in the patient or his family, and last, not least, avoidance of unnecessary penicillin injections, is the best prevention possible. We never use penicillin troches, ointments, or any other form of topical application of penicillin on account of the great incidence of surface sensitization. Skin-testing, as shown in our three cases, and as mentioned repeatedly in the medical literature, is of doubtful value. Siegel,[7] Sheppard, and other authors report that it was reliable in only 50 per cent of their cases.

It is quite possible that the increasing number of severe and sometimes even fatal reactions to penicillin, coupled with the more frequent occurrence of penicillin-resistant strains of bacteria, will, in due time, tend to reduce considerably the use of this drug. It is also important to educate the public and make it aware of the fact that the so-called "wonder drugs" are a two-edged sword and should be applied judiciously on the strictest medical indications. Our experience reveals that patients of known allergic tendencies show an unduly high rate of significant reactions to penicillin therapy and that, in this group, the indications for parenteral use of this antibiotic should be carefully reviewed in each case. At the present time we are evaluating the hazards of oral administration of penicillin in allergic individuals, and this seems to be the safest procedure for such patients.

[6] L. J. Alexander, Desensitization of Penicillin Sensitive Patients, *Arch. for Dermat. and Syphilis, 68:* 323–327, 1953.
[7] Siegel, *op. cit.*

SUMMARY AND CONCLUSIONS

Three cases of delayed reactions of the serum-sickness type following parenteral administration are reported.

These three patients had given a history of allergy, and two of them were under treatment for allergic conditions. All three had previously received penicillin injections without adverse reactions. An intradermal test to penicillin had been negative prior to administration of this antibiotic in all three cases.

A negative skin reaction to penicillin does not exclude the possibility of a delayed, serum-sickness-like reaction to this drug following parenteral administration.

Twelve Years of Nutrition Counseling in a Student Medical Clinic*

BETTY G. WALDNER, M.N.S., HELEN L. PILCHER, PH.D.,** AND CHARLOTTE M. YOUNG, PH.D., SCHOOL OF NUTRITION, CORNELL UNIVERSITY

SINCE the late fall of 1942 the Student Medical Clinic in cooperation with the School of Nutrition has provided the services of a nutritionist for the students at Cornell University. The role and function of a nutritionist in the Student Medical Clinic has been discussed more fully in a previous publication.[1] A detailed report of the development and management of the nutrition counseling service was made in a preceding issue of this journal.[2]

No attempt was made in these papers to evaluate the effectiveness of the services offered. The purpose of the present paper is to examine the clinical data accumulated over a twelve-year period from the standpoint of the nature of the student group served and the results achieved.

In reviewing the experiences of the past twelve years, 1942 to 1954, we observed that a large proportion of the students were referred with weight problems. Results obtained with these students are of interest not only because of the recent public awareness of

* The work of the nutritionist has been supported by the Gannett Foundation, Rochester, New York.

** Formerly of the School of Nutrition, now associate professor in home economics, University of Minnesota, St. Paul, Minn.

[1] C. M. Young, The Role of the Dietitian in a College Nutrition Program, *J. Am. Dietet. A., 20:* 590, 1944.

[2] C. M. Young, The Nutritionist in the Student Medical Clinic, *Student Medicine 1:* 25, 1953.

weight problems, but also for comparison with findings of other investigators working with overweight people. Some of the information gathered by the nutritionist of the Student Medical Clinic could well be related to the findings of the experimental community nutrition clinic operated by the School of Nutrition in co-operation with the Tompkins County Medical Society and the Tompkins County Board of Health.[3] In this clinic approximately 20 per cent of the patients were less than twenty-five years of age. One of its important findings was the observation that nearly 50 per cent of the patients reported the onset of obesity before the age of eighteen years. It is especially significant that of the patients in this group, 52 per cent were complete failures in regard to weight reduction and only 30 per cent were fairly successful. This is in contrast to 15 per cent and 57 per cent respectively of the group who developed obesity after eighteen years of age. Since the nutritionist in the Student Medical Clinic deals primarily with the younger age group, the data presented here may offer an interesting comparison.

Reports of dietary or nutritional consultations with university students are few and limited largely to those of weight reduction. Todd and Siemers at the University of Minnesota Student Health Service reported a weight reduction study carried out over a two-year period with 364 overweight students of various ages.[4] Students were instructed on reducing regimes ranging from 800 to 1,500 calories. Of the 364 students, 243, or 67 per cent, returned for follow-up observations. There were only 49, or 13.5 per cent, of the original group, who were successful according to the criteria set up by these workers. Most of these students were only slightly to moderately overweight. Although the men lost more in actual pounds, the women were more successful in meeting the criteria established since they had less initial weight to lose.

A review of personal dietary instructions given in the Student Health Service at the University of Michigan was reported by Bielhart.[5] Data accumulated for the period 1933 to 1938 on 1,982 stu-

[3] C. M. Young, N. S. Moore, K. K. Berresford, B. McK. Einset, What Can Be Done for the Obese Patient? *Amer. Pract. and Digest of Treatment, 6:* 685, 1955.

[4] R. L. Todd and D. P. Seimers, Results of Reducing Diets for Overweight University Students, *Journal-Lancet, 49:* 429, 1949.

[5] L. J. Bielhart, Personal Dietary Instructions in Student Health Work, *J. Am. Dietet. A., 14:* 248, 1938.

dents were summarized. Students coming to the clinic had many and varied dietary needs, with the largest number coming for problems of underweight. The next most frequent requests were for various forms of allergy diets. Of 178 underweight students who were an average of 16 pounds underweight, 106, or 59.6 per cent, showed some gain, the average gain being 5 pounds. Of the 105 overweight students with a mean excess weight of 36 pounds, 75 or 71.5 per cent, lost weight. The mean loss was 7.2 pounds.

Munves at New York University reported work done with overweight students in connection with a study of the effectiveness of the dietetic interview versus the group-discussion-decision method in the counseling of overweight students.[6] Using forty-eight students divided into two groups, she found both methods to be equally effective in a four-month reduction period. In the four-month follow-up maintenance period, however, the dietetic interview did more to influence subjects to maintain weight. When the mean-performance index for the eight months was calculated, the dietetic interview was more effective than the group-discussion-decision method in helping subjects to lose and to maintain their weight at the new lower level.

METHODOLOGY

The medical nutritionist is available at the Cornell Student Medical Clinic for three half days per week. Students are usually seen by appointment. Referrals to the clinic came from varied sources. Doctors in the Student Medical Clinic referred the largest group, 47 per cent; 30 per cent were sent in as a result of findings revealed by their physical examination; 12 per cent were "self-referred." The Physical Education Department referred 5 per cent; home physicians, 2 per cent; and an additional 2 per cent were referred by the health counselor or others. The remaining 2 per cent were "old patients" returning for further therapy. At present each student has his physical examination done by his home physician, and the records are processed by the medical staff at the University. Note is made of those who are overweight or underweight, and notices are sent to these students suggesting that they make an appointment with

[6] E. D. Munves, Dietetic Interview or Group Discussion-Decision Method in Reducing, *J. Am. Dietet. A., 29:* 1,197, 1953.

the nutritionist. Response to this is on a purely voluntary basis. Originally, from 1942 until 1950, the physical examination was done after the student came to school. The nutritionist was present for this examination and could make an appointment with each student whose weight was above or below normal for his height and age. The "self-referred" students, mentioned above, were students who asked for the services of the nutritionist and were routed through the doctor for his approval.

The nutritionist has access to the medical record of each patient to be seen. In this manner she is informed of any pertinent medical history and possibly the source of referral to the clinic. A brief running record of the nutritionist's contact with the student is incorporated in his medical chart. In addition, the nutritionist keeps a special card file for her own records. The latter is the source of the information used in this analysis. The record card includes information concerning age, address, college, college year, facilities for eating, times for meals, food likes and dislikes, amount of rest, exercise and record of whether the person uses any concentrates (vitamins or minerals). Notes are recorded as to weight history, any pertinent medical or surgical history, medications and any other related information which may be elicited from the patient. A diet history or recall of what the patient usually eats and variations thereof is taken on the first visit to the clinic.

Each patient is seen individually by the nutritionist. The first visit usually requires about thirty minutes with subsequent visits requiring anywhere from five to twenty minutes depending upon the individual and the problem. The student is urged to return weekly, if possible, should his particular problem cause him to need further help or encouragement. Frequent visits are especially important for problems regarding weight loss or gain. A weight record, if the problem is related to weight, is kept for each patient. Students are given advice in accordance with the referral or doctor's recommendations, and the nutritionist's findings in regard to the individual's eating habits and situations.

During the twelve years of operation of the clinic, only three nutritionists have participated as therapists, the first for the first seven years, the second for the next three years, and the third for the last two years.

RESULTS

Extent of Nutritionist's Contacts

From the fall of 1942 through the spring of 1954, a total of 1,391 students were seen in the clinic for a total of 5,608 visits.

The number of patients coming to the clinic each year varied from 92 to 145, with a mean of 116 and a median of 115 patients per year. The number of visits ranged from 294 to 993, with a mean of 467 visits and a median of 410 visits per year.

The total number of visits made by an individual student ranged from one to thirty visits. For the twelve-year period as a whole, an average of 3.9 visits were made per student patient per year; the median was 1.8.

Description of Patient Group

The range, mean, and median age of students served was noted for each year. Over the twelve-year period, a wide range of ages was included, varying from fifteen to fifty-eight years. The mean age of the student seen in the clinic was 19.9 years. The median age was 18.3 years. The higher mean was caused by graduate students and older veterans who were in school following the war.

Students from all four classes as well as the graduate group were represented in the nutritionist's contacts. The freshmen students were in predominance as patients. The average percentage distribution over the entire 12-year period was freshmen, 51 per cent; sophomores, 16 per cent; junior, 13 per cent; seniors, 9 per cent; graduates, 10 per cent.

More women than men students attended the clinic in each of the twelve years, the over-all average being 66 per cent women and 34 per cent men. The greater percentage of women attending the clinic was particularly noticable in the war years, when there were fewer civilian men than women on the campus, although the usual student enrollment is in the nature of three or four men to one woman.

Types of Problems Serviced

Problems of overweight or underweight concerned the majority of the students attending the nutrition clinic. The remainder of the students coming to the nutritionist fell into the following groups:

those needing help with selecting an adequate diet; those students already following therapeutic diets given by their home doctors but needing assistance in making proper substitution or modifications in a college eating situation; and those in need of therapeutic diets as a result of illness incurred while at school.

Over the twelve-year period, 66 per cent of the students had overweight problems; 22 per cent came in because they were underweight; and the remaining 12 per cent had need of dietary counsel for such conditions as diabetes, skin disorders, various gastrointestinal disorders and other miscellaneous conditions.

Of the women students who came to the clinic, about 75 per cent were overweight; 16 per cent were underweight; 10 per cent fell into the "other therapy" group. For the men in comparison, 49 per cent were overweight; 34 per cent were underweight; and 18 per cent were in the "other therapy."

The students ranged from one to 48 per cent overweight. For the twelve-year period, the women had an average and a median excess weight of 18 per cent. The men, by contrast, were an average of 26 per cent overweight with a median of 25 per cent. In terms of pounds of excess weight, the women had an average of 30 pounds with a median of 27 pounds. The mean excess weight for the men was 55 pounds, and the median was 52 pounds. For the underweight patients differences between men and women were not so great. The women were an average of 18 per cent and a median of 17 per cent underweight, while the mean and median for the men was 17 per cent. In terms of pounds underweight this was an average and median of 19 pounds for the women and 23 and 22 pounds, respectively, for the men.

Success of the Patient and the Clinic

Since it would be rather difficult to assess the success of a patient who came to the clinic for other than a problem of weight, attempt will be made to evaluate the success of the clinic in terms of results obtained with underweight and overweight students only. The results achieved are reported in two ways in terms of weight loss or gain in actual pounds and in terms of per cent excess weight loss or per cent weight deficit gained.

Weight loss in pounds: For all of the twelve years, weight loss of

patients expressed in pounds is presented in Table 1. During the entire period, 33 per cent of the men and 64 per cent of the women lost 5 pounds or less; 30 per cent of the men and 20 per cent of the women lost 6 to 10 pounds; 27 per cent of the men and 11 per cent of the women lost 11 to 20 pounds; 9 per cent of the men and only 3 per cent of the women lost over 20 pounds. In summary, then, two-thirds of the men and one-third of the women lost in excess of 10 pounds. The mean loss for the men was 10 pounds; for the women, 5 pounds. The median loss for the men was 8 pounds; for the women, 3 pounds (Table 1).

Table 1. Weight loss in obese patients, expressed in pounds.

Weight lost	*Men* (*Total, 120*)	*Women* (*Total, 445*)
0 or gained lbs.	13%	32%
1 to 5	20	32
6 to 10	30	20
11 to 15	20	7
16 to 20	7	4
21 to 30	7	3
Over 30	2	..

Weight loss as per cent excess weight: For all the students on whom height, weight, and age data were available, the degree of overweight was calculated using the standards of Baldwin and Wood in MacLeod and Taylor.[7] These tables are merely average weights of large numbers of people according to age and height; therefore, the percentage of overweight stated does not take into consideration frame size.

Only about two per cent of both men and women reached approximately average weight for their height and age; about one-sixth of both men and women lost more than 40 per cent of their excess weight; one-third of the men and one-half of the women lost 10 per cent or less of their excess weight. The mean excess weight loss for men was 19 per cent; for women, 18 per cent. The medians were 18 and 11 per cent, respectively.

[7] G. MacLeod and C. M. Taylor: *Roses' Foundations of Nutrition* (4th ed., rev.; New York: Macmillan, 1944) p. 570.

Weight gain in pounds: Similar analyses were made for weight gain of underweight patients. 62 per cent of the men and 68 per cent of the women gained 5 pounds or less; 32 per cent of the men and 26 per cent of the women gained 6 to 10 pounds; 6 per cent of both the men and the women gained over 10 pounds. The mean and median weight gained by the women was 4 pounds. The men gained a mean of 5 pounds and a median of 4 pounds (Table 2).

Table 2. Weight gain in underweight patients, expressed in pounds.

Weight gain	*Men (Total, 61)*	*Women (Total, 64)*
0 or lost lbs.	19%	31%
1 to 5	43	37
6 to 10	32	26
11 to 15	4	6
Over 15	2	6

Weight gain as per cent of weight deficit: Percentage underweight was calculated from the same standards as were used in figuring per cent of excess weight. 34 per cent of the men and 33 per cent of the women gained 10 per cent or less of their needed weight; 54 per cent of both the men and women gained 11 to 50 per cent of their deficit; 12 per cent of the men and 13 per cent of the women gained over 50 per cent of their deficiency in weight. The mean weight gain for both men and women was 23 per cent of their weight deficit. The median for men was 17 per cent; for women, 18 per cent.

Other Observations

Tabulation was made of the eating places of students who consulted the nutritionist. Of the women, the largest group, 77 per cent, ate in the dormitories or sorority houses; 13 per cent at other "on campus" dining facilities such as the Student Union, Home Economics Cafeteria, etc.; and the remainder ate in their own homes, apartments, restaurants or other "off campus" places. Forty-three percent of the men ate in an "on campus" food service establishment; 24 per cent ate in a dormitory or fraternity house; 23 per cent ate in

restaurants off campus; and the remainder ate in apartments, homes, and other places.

Because the nutritionist had an opportunity to check on in-between meal eating, a tabulation was made of the number for whom there was some record of eating between meals. Over one-half (58 per cent) ate from one to three times outside of meal time.

On each student's card record was made of whether he used any vitamins or minerals as supplements. It is interesting to note that the number using concentrates varied anywhere from one to 17 per cent through the years. They were used by an average of four per cent of the students over the entire period. The greatest usage occurred in the most recent years.

DISCUSSION

Attendance

The nutritionist in the Student Medical Clinic saw approximately two per cent of the student body yearly. The percentage of the total students coming to the nutritionist ranged from one to three per cent. Although the war years certainly brought a decrease in university enrollment, the actual number of students attending the clinic was high. Two of the four years that the nutritionist had the greatest number of student contacts were 1943 and 1944, when the university enrollment was at its lowest (Table 3).

Constant use of the clinic has continued even though school enrollment has varied considerably, and the nutritionists have changed through the years.

Age and Class

The nutritionist had an opportunity to counsel all age groups and classes. It is interesting to note the large number of freshmen, who, although busy adjusting to the newness of college life, take advantage of this service offered to them. Another factor, however, is the fact that the freshmen have been sent notices to the effect that they were underweight or overweight, and consequently have been notified of the existence of the clinic. Are they using the nutritionist, in addition to any help they need with adjustments of food intake, as one of their means of adjusting to the new college environment? It might

Table 3. Nutritionist's contacts with patients, 1942–1954.

Year	*No. of visits*	*No. of patients*	*Average no. visits per patient*	*Median no. visits per patient*	*Range of visits per patient*	*University enrollment*
1942–1943	294	92	3.2	1.5	1–16	6,957
1943–1944	565	134	4.2	2.5	1–22	4,486
1944–1945	416	145	2.9	1.0	1–26	4,898
1945–1946	402	130	3.0	1.0	1–21	7,928
1946–1947	298	90	3.3	1.5	1–19	9,022
1947–1948	338	117	2.9	1.0	1–24	9,461
1948–1949	450	114	3.9	1.5	1–27	9,343
1949–1950	404	120	3.3	1.0	1–27	9,454
1950–1951	296	97	3.0	1.0	1–25	9,338
1951–1952	496	105	4.7	1.5	1–26	9,256
1952–1953	656	108	6.0	4.0	1–28	9,158
1953–1954	993	139	7.0	4.5	1- 30	9,198
Mean.....	467	116	3.9	1.8	....	....
Median	410	115	...	...	....	....

be supposed that once these adjustments have been made, they have less need for other support or dietary advice. This may explain the lower numbers of upperclassmen coming to the nutritionist.

Sex of Patients

The women students used the clinic more than did the men students. As might be expected, the greatest predominance of women was in the war years of 1943 and 1944, when the enrollment of men on the campus was low. Since the majority of problems dealt with in the clinic were ones of weight, it seemed logical that more women than men for cosmetic reasons would seek aid for losing or gaining body weight. It will be noted that a higher percentage of the problems bringing women to the nutritionist were concerned with overweight. Also it will be noted that the mean and median excess weight, either percentage-wise or in pounds, which brought women to the clinic were considerably lower than for the men.

There was both a greater percentage and a greater number of men than women referred to the clinic for dietary counsel for problems other than weight in nine out of the twelve years. The greatest numbers occurring in this group were in the years immediately following the war, 1945 to 1948, when large numbers of veterans were returning

to school. Possibly they were in need of therapy for problems incurred as a result of war tensions and stresses.

Types of Problems

No set forms or printed instructions were given to the students, but individual counseling was given to each one. Needless to say, every student presented a unique situation. Usually, in problems of weight, no specific calories were ordered by the physician. It was left to the nutritionist to suggest to the student what she thought best for his specific problem in light of pertinent information given by the doctor and her findings in the initial interview.

In the cases of those students referred for problems other than weight, the diet was nearly always prescribed by the physician. Those students with weight problems constituted the greatest number of the group who made successive visits. All patients were urged to return for further counseling or if they had additional questions, but often those students who did not have weight problems, once they had received dietary help and advice, returned to their physician.

The measure of success achieved by the students in reaching their goals, hence the success of the nutritionist's work itself, must be considered from two points of view: those intangible results that cannot be measured in concrete terms and the more tangible results, which in this instance must be measured largely by weight loss or weight gain. The intangible results are most easily dismissed, since they can be measured only indirectly. Included among them are the satisfactions received which lead to the voluntary return of the students to the nutritionist for repeated visits, the gratitude expressed in a variety of ways by the patients and parents, and the evidences of an educational job done. Certainly the continued attendance of many patients showed that students were gaining something which motivated them to return for repeated visits with the nutritionist. Over one-half of all students made more than the initial visit. One likes to think that the nutritionist, because of the rapport she has established with the student, helps him with her understanding and appreciation of his individual problem in addition to the technical advice which she can give. Also, a definite preventive and educational service is provided by the nutritionist. The educational service comes through teaching the basis of an adequate diet

and relative food values, through clearing up misconceptions concerning these, through helping the student to see the various purposes—nutritional and nonnutritional—which food is serving for him. The nutritionist in the student medical service has a unique opportunity, for she deals with the student when he is receptive to teaching, because he is motivated by interest in a personal problem; he is young; he has the additional advantage of higher education; and he usually has the means of carrying on what he is taught if he can be motivated to do so. It is a common experience of the nutritionist to have students come to her for help with confidence, expressed as "because you really know what is good for me to do." Also, a student expresses his parent's reassurance on knowing that the student's fledgling effort to reduce is under professional guidance.

As mentioned previously, quantitative measures of the success of the patients will have to be related to the weight losses and gains of the overweight and underweight students. Certainly one can see quite readily that the actual losses and gains were not great and that very few of the men or women achieved the degree of success represented by losing most of their excess weight or by gaining to their desired weight. In comparing the results achieved by our students with those of the two student groups mentioned previously,[8,9] we see that the findings do not differ greatly. The overweight women studied at the University of Minnesota who were on dietary restriction without medication had a total average loss of 7.5 pounds.[9] The over-all average loss of the overweight men and women who returned for follow-up therapy in the Bielhart study was 7.2 pounds, and the average gain for the underweight students was 5 pounds.[10] The average weight loss for the overweight students in our study was 8 pounds, and the average gain for the underweight students was 5 pounds. Although weight losses and gains were not spectacular among any of the three university groups, one is led to propose that the Cornell group did about as well as the student groups reported.

It is interesting to compare the Student Medical Clinic results in regard to weight loss with those of the older group studied in the experimental community nutrition clinic.[11] Although the average

[8] Todd and Seimers, *op. cit.*, and Bielhart, *op. cit.*
[9] Todd and Seimers, *op. cit.*
[10] Bielhart, *op. cit.*
[11] Young, Moore, Berresford, and Einset, *op. cit.*

loss of the adult women in the experimental clinic was 14.3 pounds, only 10 per cent reached their ideal weight. However, among the adults in the experimental nutrition clinic, 32.1 per cent of the women and 30.8 per cent of the men lost more than 40 per cent of their excess weight. Among the younger patients served by the Student Medical Clinic, only 15 per cent of the women and 17 per cent of the men achieved the same level of success. These figures might be interpreted as further evidence that, given even the best of therapeutic conditions, the younger patients developing obesity in most instances during childhood or adolescence are more difficult to treat successfully. Still further evidence of this point is seen in the fact that of the adult patients served by the experimental community nutrition clinic, 25.3 per cent of those who became obese during childhood or adolescence lost more than 40 per cent of their excess weight. Of those who became obese as adults, 43.5 per cent lost more than 40 per cent of their excess weight.[12] It is to be remembered that the group from the experimental community nutrition clinic had a much longer period of therapy per person and that the experiment was carried out under conditions designed to produce maximum possible success. Many of these conditions prevailed in the Student Medical Clinic, but less effort was made to maintain contact with students who voluntarily stopped coming to the Clinic.

The underweight and overweight students achieved surprisingly similar results in terms of pounds gained and lost (Tables 1 and 2). In comparing the mean weight deficit gained by the underweight patients, 23 per cent, with the mean excess body weight lost by the overweight patients, 19 per cent, one notes that they, too, are very similar. These observations are interesting to the authors, since they had been under the impression that the underweight patient is often less strongly motivated and appears to "give up" more easily than the overweight patient. However, it is interesting to note that over the twelve-year period only 42 per cent of underweight patients who were instructed returned for follow-up visits, while 60 per cent of the overweight patients showed sufficient motivation to return. Actually, an almost identical percentage of both underweight and

[12] *Ibid.* It should be recognized that in the young patients excess weight was based on average height and weight and, in the older patients, it was based on "ideal weight," which involves consideration of frame size.

overweight patients who did return showed progress; 73 per cent of such overweight patients lost weight. It would appear that the difference in responsiveness of the two types of patients lies primarily in their initial motivation to be interested in achieving weight loss or gain. There was a surprising number of students (now included in our overweight group) whose primary purpose in coming to the clinic was to learn how to control their weight at its present status.

SUMMARY

Records kept on 1,391 students served by the nutritionist in 5,608 visits to the Student Medical Clinic from the late fall of 1942 through the spring of 1954 were analyzed. An average of 116 students was seen yearly, making an average of 3.9 visits per person.

The largest number of students (47 per cent) were referred to the nutritionist by doctors from the Student Medical Clinic; 30 per cent were asked to come in as a result of findings revealed by their physical examination; 12 per cent were "self-referred" and the remaining 11 per cent were referred by home physicians, the physical education department, health counselor or other sources.

More women than men students used the services of the nutritionist, although the usual peace-time university enrollment had a greater ratio of men students. All of the classes were represented with freshmen students during their period of adjustment to college in predominance. Over the twelve-year period, 66 per cent of the students had problems of overweight; 22 per cent problems of underweight; and the remaining 12 per cent needed dietary counsel for various other reasons.

The success achieved by the students and hence the success of the nutritionist's work were evaluated by consideration of both the intangible and the tangible results. The intangible results were the apparent satisfaction of student needs expressed by continued voluntary use of the services of the nutritionist, the gratitude expressed in various ways by the students and parents, and the evidences of an educational job done.

The more tangible results, of necessity, were measured largely by weight gains or losses. The average weight loss for the overweight

student was 8 pounds, and the average gain for the underweight student was 5 pounds. These weight changes accounted for a mean loss of excess weight of 19 per cent and a mean gain of weight deficit of 23 per cent. Although fewer underweight students (42 per cent) than overweight students (60 per cent) returned after the initial instruction, an almost identical percentage of both groups who did return showed progress; 73 per cent of the overweight patients lost weight, and 74 per cent of the returning underweight patients gained weight. These results compared favorably with those reported by other college groups. In relating results from the Student Medical Clinic to those obtained with adult patients in a local experimental community nutrition clinic, one feels that they give further evidence that the younger patients who develop obesity in most instances during childhood or adolescence are more difficult to treat successfully than the patients who develop obesity in the adult years.

Questions Arising from the Survey "Health Services in American Colleges and Universities, 1953"*

NORMAN S. MOORE, M.D., AND JOHN SUMMERSKILL, PH.D., CORNELL UNIVERSITY

AS SOME of you will recall, the survey of college health services was completed last spring—just before the Fourth National Conference (on Health in Colleges). This survey was the fortieth in this field in twenty years. It was different from its predecessors. Because of the resources available, we managed to get a comprehensive, nation-wide picture of the health facilities of colleges. One of the most important resources was the interest which we encountered in colleges—the interest of administrators in matters of student health. Another important resource was the Continental Casualty Company, which contributed the funds and manpower which made it possible to survey 1,157 colleges by personal interviews.

We think these two points are noteworthy. First, that colleges are happy to co-operate in investigations of this kind if approached thoughtfully and courteously. And second, that constructive research in student health can be carried out in co-operation with reputable commercial organizations.

One of the first things which we learned from the survey concerns the size of American colleges. Those of us planning the survey did not fully appreciate the fact that large colleges and universities—say those with more than 2,000 students—are really few and far between in the whole panorama of higher education in America. There are nearly 1,900 colleges in this country, and the majority

* Read by John Summerskill at the meeting of the American College Health Association, April 29, 1955, Colorado Springs, Colorado. Reprinted from the *Proceedings* of the American College Health Association.

have less than 500 students. The typical college has less than 500 students enrolled in two-year or four-year programs.

Correspondence about the survey left no doubt that many of these small colleges are concerned about student health. Where can these colleges get information and counsel? As far as we know there has been virtually no study of the ways in which student medicine can be most effectively practiced in a student body which numbers a few hundred. Generally speaking, the survey was drawn up from the perspective of larger colleges. The ACHA is essentially an organization of large schools. There are forty different colleges represented on the council and standing committees of the Association now, but none of these has an enrollment under 500. Indeed, the average enrollment among these forty colleges is 15,000 students.

As a result of the survey experience, we recommend that the ACHA extend the scope of its interest and activity to include the special medical problems of small colleges. A standing committee on student medicine in small colleges would seem most appropriate. The service which the Association could render these colleges would undoubtedly strengthen the membership of the Association itself.

The findings of the survey show that across the country there is a tremendous diversity in student health practices. We would like to bring to your attention just a few questions raised by the survey. We do not pretend to have all the answers to these questions, but we do think they are worth careful consideration by the Association.

First, is the protection of a student body by vaccinations and immunizations the responsibility of a college in any way? The fact is that the majority of colleges require no vaccinations or immunizations for entering students. Interest in this question is heightened by recent developments with the antipoliomyelitis vaccine. A considered statement by the ACHA about the responsibility of colleges with regard to various vaccinations and immunizations would be of value in many quarters.

A second question raised by the survey concerns health education. These courses are offered in most colleges which have organized health services. The survey committee did not study the content of health education courses on a nation-wide basis, but we do have certain reflections about health education as we encountered it.

Health education, in general, is directed toward improving per-

sonal hygiene. These young men and women will have to deal with other kinds of health problems of at least equal importance. Among these will be the problems involved in providing—not just adequate—but good medical care for all persons in their communities. Many of these students will be on hospital or clinic boards and committees. Many more will participate in referendums and community decisions on preventive health measures. Nearly all will have to make up their minds whether or not to contribute money or services to the various societies supporting medical research and clinical programs. What kind of information will their decisions be based upon? The popular magazines and the newspapers barrage students with information and misinformation about health and medicine.

We wish only to raise the question: Should we do more to provide college students with a backdrop of established facts and principles for evaluating and making decisions about community health problems? In other fields (for example, political science or business administration or agricultural economics) colleges try to give students the latest facts and the most promising ideas. There appears to be a need for the same kind of approach in health education—a need to shear through superstition and lay bare up-to-date information on the nature of contemporary unsolved problems.

Here are just a few examples. Research in the field of nutrition has established that vitamin deficiencies in the American populace are most uncommon—almost nonexistent except in disease. Yet our citizens continue to believe, stimulated and supported by advertising, that taking vitamins somehow improves health. Or, another example, there is no evidence that the weather has anything to do with upper respiratory illness. In fact, strong evidence is accumulating that warm or cold, dryness or dampness, has nothing at all to do with catching cold. Yet American children are admonished to keep warm, to keep dry, and so forth, so that they will not catch cold. Superstition of this kind actually delays investigation and control of the real causes of illness.

And one last example, research has progressed about the *concept* of illness—the doctor's concept, the patient's concept, the hospital employee's concept. Every health service knows that much of the illness seen involves an essentially healthy body. Dr. Edward Stainbrook, of the Department of Psychiatry at Syracuse University,

points out that people learn a "sick role"; that is, people learn about the way sick people should act.

We find that different sociological groups at Cornell have markedly different visit rates to the Clinic. The individual's idea of when to be ill and how to be ill are determined in part by the culture—especially by influences of the family and the family doctor. This whole process needs further study, but our present understanding of these things should be transmitted to our students, who, after all, learn to use or misuse the sick role.

The emphasis in this type of health education would be on the psychological factors and economic factors and social factors—as well as on the medical factors which critically influence the health of a community. Perhaps the ACHA would be interested in promoting and planning health education along these lines. This would seem a very valuable contribution to the development of leaders who are informed and interested in "health" problems in addition to problems of personal hygiene.

In conducting the survey we were much distressed to find that we could not obtain valuable information simply because so many health services fail to keep records. Besides the clinical value of careful, comprehensive records, they provide data for necessary research and self-improvement measures. The colleges in the ACHA could give guidance to colleges throughout the country on this score. In this regard, the proceedings of the annual meeting are not a very good vehicle for getting information out to college physicians, administrators, and others concerned with student health. Too often the proceedings come to final rest in the health service director's office without wider circulation. The recommendations of the Committee on Records and the other committees should somehow find the larger interested audience.

We can raise briefly here the question of adequate care for emotional disturbance in college students. Present facilities throughout the country seem completely inadequate. Less than one college in ten has a psychiatrist associated with the health service in any capacity. There are only about sixteen colleges in the whole country with a complete psychiatric team. College budgets have become tighter, and psychiatric service more expensive. Moreover, fewer physicians are entering psychiatric training today than was the case

fifteen years ago. It looks like this situation is going to get worse rather than better. The long-range answers to the mental health problem in colleges are difficult to formulate.

And lastly, where does the student stand in student health today? Certain findings in the survey suggest that the student's standing is not very high. For example, relatively few colleges include student representatives on boards or committees on *student* health. And, for example, many health services still issue students excuses for their illnesses. The authors recognize the controversy about medical excuses, but one thing is clear: the excuse says that the student cannot take the responsibility on himself for his absence due to illness. We think college students *can* learn to take this responsibility. In fact, we think the health service has an important function in helping students develop patterns of behavior about illness which will be trustworthy and mature in their relations with their families, employers, and colleagues. These objectives require that students be given a maximum amount of responsibility in matters of student health. Could the ACHA spell out ways in which students can more fully participate in their own health programs?

Since the survey report was published there have been a good many requests for additional information. A state college in the West wished to contact all colleges offering medical care for students' families. A school of medicine requested the names of medical schools participating in student health programs. Another request came from a western university which wanted to write all health services with comprehensive dental facilities. A state college in the South requested a detailed comparison between its own student health facilities and those of comparable colleges in that area.

Because our survey data were all available on IBM cards, we were able to answer these requests quickly and efficiently. In previous years this kind of information would be obtained by launching another series of surveys. These isolated studies frequently overlapped and tried the patience of busy health service personnel.

Our experience strongly recommends the value of a central co-ordinating office for the ACHA. This office would be of tremendous value in improving communication between health services. In the opinion of those who conducted the survey, the need for this central co-ordinating office completely justifies a plan for the Association to seek and obtain funds for its operation.

Case Report of the Cornell University Infirmary and Clinic

An Unusual Case of Chronic Nephritis

Dr. Sevastianos: "This is the case of a thirty-year-old male who is a graduate student in the College of Agriculture. Medical history submitted prior to admission to Cornell mentioned the presence of chronic nephritis, chronic albuminuria, and hypertension. Because of this history, he was called in for evaluation.

"The following history was obtained. For many years, he had had recurrent severe bouts of tonsillitis, which were terminated by tonsillectomy in 1947. One episode in 1932 was unusually severe and was followed shortly by scarlet fever. In 1945 he had his first urinary symptoms at the age of twenty-one. Symptoms at the time consisted of pain at the end of urination, terminal hematuria, and slight fever for one week. He was treated for cystitis, and after about ten days the urine was entirely clear. In 1946 the symptoms recurred, and the patient noted 'white threads in his urine'. In 1947 he was inducted into the army. There was no blood pressure determination at the time of induction. Shortly after induction, the urine became brownish in color, and a urine examination revealed '0.5 gm. of albumin per liter, cylindroids, and red cells.' The blood pressure at that time was 150/90. He was given furlough for four years, during which time he had repeated urine examinations, which showed essentially the same findings. In 1950 the blood pressure was known to be 160 systolic. In 1951, at the time of permanent discharge from the army, the blood pressure was 'higher,' and abnormal urine persisted.

"In early January 1954 he was hospitalized for medical work-up, at which time the blood pressure was 230/130, eyegrounds normal, and the electrocardiogram normal. The flat plate of the abdomen revealed no abnormality. Differential blood count showed 12 per cent eosino-

philes. Eosinophilia has persisted, and heavy albuminuria has likewise persisted.

"Pertinent findings on physical examination were: B.P. 230/140; color was good, with no evidence of anemia or edema; eyegrounds appeared entirely normal with no A-V nicking, hemorrhages or exudates; the heart was not enlarged to percussion, rate was 92, rhythm regular, sounds of good quality, without murmurs; lungs were clear, without rales or other evidence of congestion; the abdomen was normal, with no palpable organs or masses, and no evidence of ascites, and there was no dependent edema.

"Laboratory findings were as follows: hemoglobin 15.9 gm., RBC 4.95 million, WBC 8,400 (P 46 per cent, L 30 per cent, M 2 per cent, E 19 per cent, B 3 per cent).

Blood chemistry: total protein 7.6 gm. per cent, alb. 5.16 gm. per cent, glob. 2.44 gm. per cent, albumin globulin ratio was 2.1 to 1, urea nitrogen 23.2 mg. per cent.

Urine: (early A.M. specimen) vol. 420 cc. pH 7.5, sp. gr. 1.005, albumin 100 mg., sugar negative, microscopic showed numerous RBC, many hyaline and granular casts, occasional RBC cast.

Addis test: vol. 670 cc., specific gravity 1.008, pH 7.0, WBC 5,800,000, RBC 138 million; casts (hyaline, fine granular and WBC) 372,000; albumin 168.8 mg. in total specimen.

Urea clearance test: standard clearance first specimen of urine 81 cc., 23.5 cc. cleared per minute (43.5 per cent of normal); second specimen urine 105 cc., 19.9 cc. cleared per minute (36.8 per cent of normal).

"It was felt to be unusual that this man should have had hematuria, marked albuminuria, and hypertension for nine years, without showing evidence of anemia, altered serum proteins, or retinal changes. It was decided to continue investigative procedures. On the flat plate of the abdomen, 'renal outline was not visualized on the right. Outline on the left is small.' An I.V. pyelogram was done, which showed that 'dye elimination is markedly reduced. Bladder shadow builds up slowly. Renal pelves and calices not visualized. Left kidney is faintly outlined on thirty minute film and appears much smaller than normal. Right kidney not visualized.'

"At this point it was felt that the probable diagnosis was chronic glomerulonephritis but that all possibilities should be explored in

view of the poor prognosis. Accordingly, arrangements were made for this patient to enter a New York hospital for further x-ray studies, to ascertain the condition of the right kidney and to rule out the possibility of unilateral renal disease as a cause of the hypertension. He was admitted to this hospital on December 22, 1954. The admission history was essentially as noted above. It was also noted that an aunt had died at the age of forty and was known to have had albuminuria. It was also noted that the patient complained of occasional right-sided headaches, not responding to aspirin.

"Physical examination at the hospital revealed the following positive findings: blood pressure elevated (varied from 190/118 to 230/130). The elevation was present in all extremities. The skin was flushed and warm. Eyegrounds show early narrowing of arterioles and slight increase in light reflex. Nasal septum was deviated to the left. There was a soft apical systolic murmur. Lungs were clear and there were no signs of congestive failure."

The following laboratory findings were reported:

Urine: Yellow, clear, sp. gr. 1.005, pH 6.0, alb. 3+, sugar negative, microscopic 15—20 RBC per HPF, 3 WBC per HPF, 1 hyaline cast per low-powered field, 10—12 granular casts seen, also an occasional pigmented cast.

Blood: Hemoglobin 15 gm., RBC 4.7 million, hematocrit 43 cc. RBC per 100 cc. blood, WBC 7,200 (P 80, L 4, E 12, B 1, 3 band cells; platelets adequate).

Stools: Guaiac negative.

Blood chemistries: B.U.N. 29 mg. per cent, carbon dioxide 27 millimols per liter, chlorides 109 milliequivalents per liter, sodium 143 milliequivalents per liter; potassium 4.5 milliequivalents per liter; total bilirubin 0.8 mg. per cent (direct 0.1, indirect 0.7). Total protein 7.5 gm. per cent with A/G ratio 4.8 to 2.7.

Urea clearance test: First hour 30.4 per cent, second hour 26.9 per cent, with 1.28 cc. per minute first specimen and 0.78 cc. per minute second specimen; urine protein 1.14 gm. per 2000 cc.

Sputum: Acid-fast smear negative (December 26, 1954).

Urine culture: Negative.

PSP test: 10 per cent excretion at 15 minutes, 6 per cent at 30 minutes, 8 per cent at 60 minutes, and 6 per cent at 120 minutes; total of 30 per cent.

X-ray of chest: Normal.

Nephrotomogram: "Nephrotomography demonstrated both kidneys to be small and contracted. Their shape otherwise was normal. No findings to suggest cyst or tumor were identified. In the arterial phase of the examination, the renal arteries were not well visualized, but there was a suggestion that they were smaller than is normally seen. Impression: bilateral contracted kidneys compatible with chronic glomerulonephritis."

X-rays of sinuses: Normal.

Electrocardiogram: December 23, 1954, normal sinus rhythm; left axis deviation and an essentially normal unipolar electrocardiogram.

"The patient was comfortable during his hospital stay, except during the day following nephrotomography. At that time, his temperature went up to 39.2 C. In addition, he developed flushing, nervousness, and arrhythmia and vomited four times. Pulse was irregular, rate 88. He gave a history of previous "arrhythmia." EKG showed auricular fibrillation. The patient was given Benadryl and sedation and next morning showed normal sinus rhythm and normal temperature. This episode was thought due to a reaction to the dye used in X-ray studies.

"While in the hospital, the patient was put on a regimen of low-protein diet, plus Serpasil and Apresoline. The final dosage of Apresoline was 75 mg. at 7 A.M., 3 P.M., and 10 P.M. Serpasil was given in dosage of 0.5 mg. twice daily. On this program, his blood pressure fell during his hospital stay to an average of 150/105.

"At the time of discharge from the hospital, he was on Serpasil and Apresoline as outlined. In addition, he was given oral penicillin, 100,000 units t.i.d., which he was to take during the winter months. He was instructed in a diet containing 40 gm. protein and 5 gm. salt."

Dr. Darsie: "There are a number of unusual features about this case. If the history is accurate, this patient has had chronic glomerulonephritis for almost ten years, with heavy albuminuria, hematuria, increasing hypertension, and nitrogen retention. At the same time, he has no evidence of anemia, no depletion of his serum proteins, very minimal retinopathy, and no cardiac enlargement.

"Initially, the possibilities of polycystic kidneys, various types of obstructive disease of the kidneys, and so forth were considered.

The x-ray studies which have been done rule out these possibilities.

"Eosinophilia is another interesting feature. By history this has been present for at least eighteen months (varying from 12 per cent to 23 per cent). It is possible that this is on the basis of intestinal parasites, but stool exams have shown no evidence of ova or adult parasites. Urine examinations have shown no schistosome ova, which one might look for because of the history of terminal hematuria (1945 and 1946). He complains of nasal stuffiness—perhaps an allergic rhinitis might be a causative factor in this eosinophilia.

"In addition, the diagnosis of peri-arteritis nodosa must be kept in mind. The findings of progressive renal disease, hypertension, and eosinophilia are certainly compatible with this diagnosis."

Dr. Moore: "The question of peri-arteritis nodosa is an interesting one, but unfortunately it would not change the ultimate prognosis in this case, which of course, is poor, in the long run. There are a number of hopeful features, i.e., he still has very minimal retinal changes, absence of anemia, and no evidence of depletion of serum proteins. His good response to antihypertensive drugs is likewise encouraging, and he may have a long period of useful life.

"On the other hand, I have seen this type of patient go downhill very rapidly.This may occur by one of several routes: (1) cerebral vascular accident—if we can keep his blood pressure reasonably low, we may be able to delay this possibility; (2) congestive heart failure—it is encouraging that this young man has no evidence of cardiac enlargement by x ray; it is true that the EKG shows left axis deviation and some sign of left ventricular strain; (3) progressive renal disease and renal failure—by using prophylactic penicillin, we may be able to eliminate recurrent streptococcal infections which accelerate the renal disease. Of course, this boy already has nitrogen retention and diminished urea clearance. It would not be surprising if he went slowly into progressive uremia."

Dr. Alexander: "It will be interesting to see what happens during the course of his antihypertensive therapy. Up until this point, Serpasil and Apresoline have been quite successful in lowering his blood pressure. It is possible that his urea clearance will go down with the blood pressure."

Dr. Moore: "That is true, and it will be interesting to repeat the urea clearance test in a month or so.

"The low-protein diet is believed to minimize the work of the kidney and thereby prolong its usefulness. This diet will be adhered to in this patient unless he develops edema or evidence of depletion of serum proteins. If this develops, high protein diet and more rigorous salt restriction will be utilized.

"In any case, this type of patient should be followed closely, because renal failure may develop quite rapidly."

Addendum: Urea clearance test was repeated approximately 6 weeks after the above presentation, with the following results:

1st specimen—vol., 96 cc., 1.6 cc. per minute, standard clearance 9.6 cc. per minute cleared (17.9 per cent of normal).

2nd specimen—vol., 134 cc., 2.23 cc. per minute, maximum clearance 14.05 cc. per minute cleared (18.7 per cent of normal).

During the ensuing six months, this young man has gotten along fairly well. His blood pressure has been maintained between 155/90 and 175/110. At times of stress, his pressure has gone up. He has had no illness of consequence, feels well except for an occasional occipital headache. He has had two more brief episodes of "arrhythmia," which have lasted not more than one-half hour.